

Effect of carbon nanotubes on the compression test and energy absorption of aluminium/polyurethane-carbon nanotubes foam sandwich

Abstract

The foam was prepared by mixing the polyols, isocyanate and carbonnanotubes (CNTs) at 1000 rpm speed. The different content of the CNTs are varies from 0 3 (0, 0.5, 1.5, 2.0, 2.5, 3.0) percent by weight. The foam sandwich was prepared by using hand lay-up method with epoxy and hardener as the adhesive to bind the surface between Polyurethane (PU) - CNTs and Aluminium (Al) sheet. The effect of different CNTs content was studied on the compression test and energy absorption. The compression test results show fluctuated values with increasing percentage of CNTs in PU foam. This trend may due to particles agglomeration as the nanosize of CNTs can make the particles to agglomerate easily due to the strong adhesive force between the nanoparticles. The size of the CNTs particles might not similar thus it is believed that the distribution of the particles were not well. Increasing in percentages of CNTs in PU foam found to improve the energy absorption from 0.115 J for control PU foam to 0.140 J for PU-CNTs foam with 3% CNTs.

Keywords; Aluminum (Al), Carbon Nanotube (CN), Compression Test, Energy Absorption, Foam Sandwich